REMARKS

Claims 1, 3-19, 21-35, and 38-45 have been amended. Claims 1-45 remain pending in the application. Reconsideration is respectfully requested in light of the following remarks.

Section 101 Rejection:

The Examiner rejected claims 24-29 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Specifically, the Examiner submits that claims 24-29 are rejected for claiming a data structure comprising a mere arrangement of data (i.e. nonfunctional descriptive material). The Examiner further submits that claims 24-29 do not conform to the present definition of a data structure currently accepted by the Office, in that they do not clearly provide a physical or logical relationship among data elements, designed to support specific data manipulation functions.

Claims 24-29 have been amended. Specifically, these claims have been amended to recite a machine-readable storage medium storing two or more encodings of a data structure, each encoding of data structure comprising: a first data field… a second data field… and a third data field… wherein the data stored in the first, second, and third data fields of the two or more encodings is accessible by a computer for managing the single computer resource.

Applicants assert that the fields of the claimed data structure do not describe nonfunctional, abstract ideas, but instead are clearly indicative of a physical or logical relationship among data elements (e.g., the data stored in the first data field, the second data field and the third data field), and are clearly designed to support specific data manipulation functions. For example, each field stores data indicating either a physical computer resource or attributes of a physical computer resource that may be manipulated to manage that physical computer resource. Applicants' specification clearly describes

that the values contained in these data fields are used in managing a computer resource, as claimed.

In addition, claims 24-29 do not recite mere arrangements of data, as suggested by the Examiner but explicitly recites, for example, "A machine-readable storage medium storing two or more encodings of a data structure." MPEP 2106.01 states, "When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" and also states, "a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory."

Applicants assert that the claimed machine-readable storage medium storing two or more encodings of a data structure that defines the above-noted functional interrelationships is clearly statutory.

For at least the reasons above, Applicants respectfully request removal of the rejection of claims 24-29 under 35 U.S.C. § 101.

Section 103(a) Rejections:

The Examiner rejected claims 1-45 under 35 U.S.C. § 103(a) as being unpatentable over Banga, et al. ("Resource Containers: A New Facility for Resource Management in Server Systems") (hereinafter "Banga"). Applicants respectfully traverse this rejection for at least the following reasons.

Regarding claim 1, the cited art fails to teach or suggest *encoding a first association between a single computer resource and one or more resource management policies for the single computer resource*. The Examiner submits that this limitation is

taught by Banga on page 49, in paragraphs 1-2 of section 4.1. The Examiner notes that this passage teaches, "'resource containers' are created, which contain system resources and attributes used to provide scheduling parameters, resource limits, (i.e. resource management policy)." However, Applicants assert that the resource container of Banga is clearly not an encoding of an association between a single computer resource and one or more resource management policies for that resource. Instead, Banga describes resource containers this way, "A resource container is an abstract operating system entity that logically contains all the system resources being used by an application to achieve a particular independent activity" (emphasis added). In addition, the "attributes" of the resource containers are described as merely parameter values that may be accessed by a process that implements a resource management policy. These attributes (and/or their values) do not, themselves, constitute resource management policies for a single resource. Thus, it is clear that the cited passages of Banga describing creating a resource container teach nothing about the above-referenced limitation of claim 1.

As described in Banga, rather than representing an association between a single resource and resource management policies to be used to manage that single resource, a resource container represents the collection of all system resources being used by an application or activity, and is used to collectively track and manage usage of all of the resources by the application/activity (see, e.g., page 46, column 1, paragraph 2, "All user and kernel level processing for an activity is charged to the appropriate resource container, and scheduled at the priority of the container." In other words, Banga teaches the management of all resources used by an activity **collectively**. This is in direct contrast to the resource management mechanism of Applicants' claimed invention, which associates resource management policies with a single resource. It is clear from the cited passages and other passages of Banga that the resource container of Banga represents a completely different entity than the association recited in Applicants' claim, and that it serves a completely different purpose. Applicants remind the Examiner, "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." *In re Ratti*, 270 F.2d 810, 123

USPQ 349 (CCPA 1959). A modification of Banga to associate resources and resource policies at the level of a single resource, rather than at the resource container level, would change the principle of operation of Banga's system.

Similarly, the cited art fails to teach or suggest *encoding a second association between the single computer resource and one or more resource management policies for the single computer resource, wherein at least one of the one or more resource management policies associated with the single resource by the second encoding is different from the one or more policies associated with the single resource by the first encoding*. Since Banga does not teach or suggest encoding an association between a single computer resource and one or more resource policies for that single computer resource, Banga clearly cannot teach or suggest a second such encoding, much less one for which at least one of the resource management policies associated with the single resource is different from the one or more policies associated with the single resource by the first encoding, as claimed.

Further regarding claim 1, the cited art fails to teach or suggest *binding one or more encapsulated computations that are consumers of the single resource to a single one of the first and second encodings*. The Examiner submits that this limitation is taught by Banga on page. 49, in paragraphs 1-2 of section 4.2. The Examiner notes that this paragraph teaches, "threads are bound." This passage describes that threads may be dynamically bound to a resource container. Applicants first note that a "thread" is not analogous to an "encapsulated computation," as the threads of a given process typically interact with each other (i.e. sharing state, memory, and/or other resources) to complete an activity. Applicants also note that, as discussed above, a resource container is not analogous to an association between a single resource and resource management policies for that resource, or an encoding thereof. Instead, it represents a collection of resources that are managed at the container level. For example, the passage cited by the Examiner includes the following, "With resource containers, the binding between a thread and a resource principal is dynamic, and under the explicit control of the application; we call this the thread's resource binding. The kernel charges the thread's resource usage to this

container." Note that as described in the cited passage itself, the term "resource principal" does not refer to a resource, but to the entity for which resource usage is charged (i.e. a thread, process, activity, application, or as in Banga, a resource container for an activity). Applicants assert that this passage does not describe binding a thread to a resource, much less to one of two encodings of an association between a single resource and different resource management policies for that resource, but to an abstract collection of all resources (including kernel resources) used by that thread. Therefore, Applicants assert that binding a thread to a resource container clearly does not teach or suggest binding an encapsulated computation to one of two such encodings, as claimed.

Further regarding claim 1, the cited art fails to teach or suggest *executing the one or more encapsulated computations in accordance with the one or more resource management policies for the single computer resource that are associated with the single computer resource by the single encoding that is bound to the one or more encapsulated computations*. The Examiner admits that Banga does not explicitly teach this limitation. The Examiner submits, "However, it would have been obvious to one of ordinary skill in the art at the time of the invention, that execution according to the resource management policy would be performed. One would be motivated by the desire to execute the system to perform its intended function and design." Applicants again assert that Banga does not teach or suggest encoding an association between a single resource and one or more resource management policies for that resource (much less two such encodings), or binding one or more encapsulated computations to one of two such encodings. Therefore, Banga cannot, and does not, teach or suggest executing such computations according to the policies associated with the resource through the encoding.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 1 is unsupported by the cited art, and removal thereof is respectfully requested.

Regarding claim 3, the cited art fails to teach or suggest that *an encapsulated computation does not share state with other encapsulated computations*. The Examiner

submits that Banga teaches this limitation on page 48, column 2, paragraph 1. Specifically, the Examiner states, "individual threads are scheduled independently, therefore each have an independent state." Applicants assert that thread scheduling has nothing to do with whether or not threads share state, and further assert that the threads of a given process typically do share state, as well as memory and other resources. Applicants assert that nothing in the evidence of record describes the encapsulated computations of Applicants' claim 3, much less that such encapsulations are bound to an encoding of an association between a single resource and resource management policies for that resource, as in Applicants' claimed invention.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 3 is unsupported by the cited art, and removal thereof is respectfully requested.

Independent claims 13, 35, and 42 include limitations similar to those of claim 1 and 3, and were rejected for the same reasons. Therefore, the arguments presented above apply with equal force to these claims, as well.

Regarding claim 4, the cited art fails to teach or suggest that *encoding the first association includes instantiating a first resource domain structure, wherein the first resource domain structure includes data indicating the single computer resource.* The Examiner again cites page 49, section 4.1 as teaching this limitation, referring to the creation of a resource container. However, as discussed above, a resource container does not represent an association between a single resource and one or more resource management policies. Therefore, the creation of a resource container is not analogous to the instantiation of a resource domain structure indicating the single resource associated with resource management policies for that resource through the encoding.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 4 is unsupported by the cited art, and removal thereof is respectfully requested.

Regarding claim 5, the cited art fails to teach or suggest that the *encoding further includes indicating a set of one or more policy actions for the single resource, the set of policy actions corresponding to the one or more resource management policies*. The Examiner again cites page 49, section 4.1 as teaching this limitation, stating that resource containers contain resource limits. This section actually states, "Containers have attributes; these are used to provide scheduling parameters, resource limits, and networkQoS values." Applicants assert that there is nothing in Banga that describes these "attributes" as policy actions corresponding to resource management policies for a single resource, as in Applicants' claimed invention. Instead, they appear to be merely parameters, whose value can be set and/or read by an application or by another process that manages resources. In addition, these attributes are not indicated in an encoding of an association between a single resource and one or more resource management policies for that resource, since, as discussed above, the resource container of Banga is not analogous to the claimed encoding.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 5 is unsupported by the cited art, and removal thereof is respectfully requested.

Claim 15 includes limitations similar to those of claim 5, and was rejected for the same reasons. Therefore, the arguments presented above apply with equal force to this claim, as well.

Regarding claim 6, the cited art fails to teach or suggest that *the program instructions are further executable to implement a policy imposing isolate installing the set of policy actions in the first resource domain structure*. The Examiner admits that Banga does not explicitly teach this limitation. The Examiner submits, "It is well known in the art that operating systems and runtime environments such as Java have processes that perform resource management. It would have been obvious to one of ordinary skill in the art at the time of the invention that a process or thread that manages resources

would impose the management policies." Applicants note that the claim does not recite a policy imposing isolate managing policies, but recites that a policy imposing isolate installs the set of policy actions in the first resource domain structure (i.e. the policy actions included in the encoding of the first association between the resource and resource management policies). Applicants assert that, as discussed above, Banga does not teach the resource domain structure of Applicants' claim, much less that a policy imposing isolate installs policy actions in such a structure.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 6 is unsupported by the cited art, and removal thereof is respectfully requested.

Claim 19 includes limitations similar to those of claim 6, and was rejected for the same reasons. Therefore, the arguments presented above apply with equal force to this claim, as well.

Regarding claim 7, the cited art fails to teach or suggest that *the first resource domain structure also indicates a set of one or more triggers for the single resource, wherein the one or more triggers correspond to respective actions of the set of policy actions*. The Examiner admits that Banga does not teach these limitations. The Examiner submits, "It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Banga to include triggers. It is well known in the art that management policies comprise rules based on inputs that allow for determinations to be made on those inputs." Applicants again assert that Banga does not teach or suggest the resource domain structure or the policy actions of Applicant' claims. Therefore, Banga cannot, and does not, teach or suggest the additional limitations on the contents of the resource domain structure recited in claim 7. Applicants further assert that the Examiner's remarks regarding the general use of triggers within management policies does not teach or suggest that an indication of a set of such triggers be included in a resource domain structure, as claimed.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 7 is unsupported by the cited art, and removal thereof is respectfully requested.

Claim 44 includes limitations similar to those of claim 7, and was rejected for the same reasons. Therefore, the arguments presented above apply with equal force to this claim, as well.

Regarding claim 8, the cited art fails to teach or suggest that *the first resource domain structure also indicates that a reservation on the single resource has been established*. The Examiner admits that Banga does not teach that the resource domain structure also indicates a reservation on the resource. The Examiner submits, "However, it would have been obvious to one of ordinary skill in the art at the time of the invention to reserve resources. One would be motivated by the desire to ensure that there was some level of guaranteed resources availability." As discussed above, Applicants again assert that Banga does not teach or suggest the resource domain structure of Applicants' claim. Therefore, Banga cannot, and does not, teach this additional limitation on the resource domain structure. Applicants note that the claim does not merely recite that resources can be reserved, but requires that a resource domain structure indicate that a reservation on the corresponding single resource has actually been established. The Examiner's remarks regarding the general use of reservations for managing resources clearly does not teach or suggest this specific limitation of a resource domain structure.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 8 is unsupported by the cited art, and removal thereof is respectfully requested.

Claims 18, 29, and 34 include limitations similar to those of claim 8, and were rejected for the same reasons. Therefore, the arguments presented above apply with equal force to these claims, as well.

Regarding claim 9, the cited art fails to teach or suggest that *binding the one or more encapsulated computations to a single one of the first and second encodings comprises indicating in a registry each of the encapsulated computations and the single encoding*. The Examiner submits that Banga teaches this limitation on page 52, column 2, paragraph 3. The Examiner states, "resource containers enable precise accounting of activities, therefore there exists some registry to enable such accounting." The cited passage actually states, "Because resource containers enable precise accounting for the costs of an activity, they may be useful to administrators simply for sending accurate bills to customers, and for use in capacity planning." Applicants assert that a mechanism for accounting for the costs of an activity (i.e. actual resource usage) has nothing to do with a registry that indicates encapsulated computations and one of two encodings between a single resource and resource management policies to which those encapsulations are bound. As discussed above, Banga does not teach or suggest Applicants' claimed encoding or Applicants' claimed binding. Therefore, Banga cannot, and does not, teach or suggest indicating each of the encapsulated computations and the single encoding in a registry, as claimed.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 9 is unsupported by the cited art, and removal thereof is respectfully requested.

Claim 21 includes limitations similar to those of claim 9, and was rejected for the same reasons. Therefore, the arguments presented above apply with equal force to this claim, as well.

Regarding claim 11, the cited art fails to teach or suggest that *binding the one or more encapsulated computations to a single one of the first and second encodings comprises indicating to each of the encapsulated computations the single encoding*. The Examiner submits that Banga teaches this limitation on page 49, in section 4.2. The Examiner notes that this passage describes that "threads can be bound to different containers depending on need." **This has absolutely nothing to do with the limitations**

of claim 11. Applicants again assert that Banga does not teach or suggest the encodings or the binding of Applicants' claims, much less indicating the single encoding to each of the encapsulated computations to which the single encoding is bound.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 11 is unsupported by the cited art, and removal thereof is respectfully requested.

Regarding independent claim 24, the cited art fails to teach or suggest *two or more encodings of a data structure, each encoding of the data structure comprising a first data field configured to store data indicating a same single computer resource*. The Examiner submits that Banga teaches "a first operation to indicate a computer resource" as "creating a new container" on page 51, column 1. Applicants note that the claim does not recite "a first operation", but "a data structure comprising a first data field." As discussed in detail above, the resource container of Banga is not a data structure, nor does it indicate a single resource. Instead, it is an abstraction of a collection of all system resources used in an activity. Therefore, "creating a new container" clearly does not teach or suggest the data structure of claim 24, nor the creation of such a data structure.

Further regarding claim 24, the cited art fails to teach or suggest that the data structure comprises *a second data field configured to store data indicating one or more resource management policies for the single computer resource, wherein data stored in the second data field of one of the two or more encodings indicates at least one resource management policy for the single computer resource that is different from the one or more resource management policies for the single computer resource indicated by the data stored in the second data field of another one of the two or more encodings*. The Examiner cites page 51, column 1, "Container attributes" as teaching "a second operation to indicate a resource management policy". Again, Applicants note that the claim does not recite "a second operation" but "a second data field" of a data structure. As noted above, the resource container of Banga is not a data structure, and its attributes do not indicate a resource management policy for the single computer resource indicated in a

first data field of the same data structure, as claimed. Instead, it is an abstraction of a collection of all system resources used in an activity. Therefore, the "container attributes" operation cited by the Examiner, which may be used to set or read the attributes of a container, clearly does not teach or suggest the above-referenced limitation of claim 24. Furthermore, since Banga does not teach or suggest the two or more data structure encodings of Applicants' claims (each indicating the same single computer resource), Banga clearly cannot teach or suggest that *data stored in the second data field of one of the two or more encodings indicates at least one resource management policy for the single computer resource that is different from the one or more resource management policies for the single computer resource indicated by the data stored in the second data field of another one of the two or more encodings*, as claimed.

In addition, the cited art fails to teach or suggest that the data structure comprises *a third data field configured to store data indicating availability of the single computer resource.* The Examiner cites page 51, column 1, "Container usage information" as teaching "a third operation to indicate availability of the computer resource." Again, Applicants note that the claim does not recite "a third operation" but "a third data field" of a data structure. As noted above, the resource container of Banga is not a data structure. Instead, it is an abstraction of a collection of all system resources used in an activity. In addition, the "container usage information" described on page 51 does not indicate availability of a single resource, but instead indicates the resource usage information that has already been charged to a particular container. It has nothing to do with the availability of a single resource. Therefore, the "container usage information" operation cited by the Examiner, through which an application can obtain this usage information, does not teach or suggest the above-referenced limitation of claim 24.

Finally, the Examiner submits, "Banga differs from the claimed invention for not teaching that the operations are fields in a data structure. However, it would have been obvious to one of ordinary skill in the art at the time of the invention that fields would exist in order for the operations to pull such information." Applicants assert that the Examiner's remarks are unsupported by any evidence of record. The operations cited by

the Examiner are clearly not analogous to data fields of a data structure, such as those recited in claim 24. There is nothing in the evidence of recording describing that such operations necessarily require access to fields of a data structure, as suggested by the Examiner, much less the recited data structure. The fact that input data may be required for a given operation (or for the combination of the three operations suggested by the Examiner) clearly does not teach or suggest that the data be found in three different data fields of a single data structure, as claimed. Applicants assert that the Examiner has not cited anything in Banga that teaches or suggests the data structure of Applicants' claim, containing any of the information recited therein.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 24 is unsupported by the cited art, and removal thereof is respectfully requested.

Regarding independent claim 30, the cited art fails to teach or suggest *and executing the bound encapsulated computation in accordance with the one or more resource management policies associated with the computer resource by the resource domain structure bound to the encapsulated computation.* These limitations are similar to limitations recited in claim 1, and the Examiner refers to his rejection of claim 1 to address these limitations. Therefore, the arguments directed to claim 1 apply with equal force to this claim, as well.

Further regarding claim 30, the cited art fails to teach or suggest *preventing binding of an encapsulated computation that is a consumer of one or more computer resources to two or more resource domain structures that indicate the same computer resource, wherein each of the resource domain structures represents an association between the computer resource and one or more resource management policies, and wherein at least one of the one or more resource management policies associated with the computer resource by a first one of the resource domain structures is different from the one or more policies associated with the computer resource by a second one of the resource domain structures.* The Examiner admits that Banga does not teach this

limitation, in its previous form. The Examiner submits, "However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Banga to include preventing the binding of two encapsulated computations with the same resource. One would be motivated by the desire to perform computer resource protection or isolation." Applicants assert that the Examiners remarks are completely speculative and not supported by any evidence of record. In addition, claim 30 does not recite anything about preventing the binding of two encapsulations to the same resource but instead is directed to preventing binding of an encapsulation to two or more resource domain structures, where the resource domain structures represent associations between the same computer resource and different resource management policies. Therefore, the Examiner's remarks regarding protection and isolation of resources are irrelevant to the above-referenced limitation of claim 24. As discussed in detail above, Banga does not teach or suggest the claimed resource domain structures, or binding encapsulated computations to such structures. Therefore, Banga clearly does not teach or suggest that if two different resource domain structures indicate the same computer resource but at least one different resource management policy for that computer resource, an encapsulated computation of that resource is prevented from binding to both of those resource domains, while it is allowed to bind to two different resource domains that indicate different computer resources, as required by Applicants' claim.

For at least the reasons stated above, Applicants assert that the Examiner has failed to establish a *prima facie* rejection. The rejection of claim 30 is unsupported by the cited art, and removal thereof is respectfully requested.

Applicants assert that numerous other ones of the dependent claims recite further distinctions over the cited art. Applicants traverse the rejection of these claims for at least the reasons given above in regard to the claims from which they depend. However, since the rejections have been shown to be unsupported for the independent claims, a further discussion of the dependent claims is not necessary at this time. Applicants reserve the right to present additional arguments.

CONCLUSION

Applicants submit the application is in condition for allowance, and an early notice to that effect is respectfully requested.

If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/6000-33400/RCK.

Respectfully submitted,

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